

CLAIMS

What is claimed is:

1. A system for applying adhesively coated material to at least a first portion and a second portion of a semiconductor die mounting site of a first leadframe and second leadframe of a plurality of leadframes for attachment of a semiconductor device thereto in a wire bonding apparatus, said system comprising:
a first source for supplying a first length of adhesively coated material at a first location of said at least a first portion of said semiconductor die mounting site of said first leadframe of said plurality of leadframes form in a continuous manner;
a second source for supplying a second length of adhesively coated material at a second location of said at least a second portion of a semiconductor die mounting site of a second leadframe of said plurality of leadframes in a continuous manner;
indexing apparatus including:
apparatus for moving said plurality of leadframes relative to said application apparatus in a single leadframe by single leadframe movement of said plurality of leadframes in a continuous manner; and
application apparatus for receiving said plurality of leadframes in a leadframe-by-leadframe sequence in a continuous manner, said plurality of leadframes having a removable portion for engagement by a portion of said application apparatus, said application apparatus for receiving said first length of adhesively coated material at said first location of said at least a portion of said semiconductor die mounting site of said first leadframe of said plurality of leadframes and for receiving said second length of adhesively coated material at said second location of said at least a portion of said semiconductor die mounting site of said second leadframe of said plurality of leadframes, said application apparatus having cutting apparatus for cutting a first increment of said first length of adhesively coated material and for applying said first increment to the first location of said at least a first portion of said semiconductor die mounting site of said first leadframe of said plurality of leadframes upon indexing to said first location and for cutting a second

increment of said second length of adhesively coated material and applying said second increment to said second location of said at least a second portion of said semiconductor die mounting site of said second leadframe of said plurality of leadframes upon indexing to said second location, said application apparatus including:

a first cutting structure located at the first location having a first cutting die, the first cutting structure for receiving said first length of said adhesively coated material and for receiving said first cutting die movable relative to said first cutting structure for receiving said first length of said adhesively coated material; operation apparatus positioned to move said first cutting die relative to said first cutting structure for forming said first increment and for urging said first increment against said first location of said at least a first portion of said semiconductor die mounting site of said first leadframe of said plurality of leadframe;

a second cutting structure located at the second location having a second cutting die, said second cutting die structure configured for receiving said second length of said adhesively coated material and for receiving said second cutting die, the second cutting die movable relative to said second cutting structure for receiving said second length of said adhesively coated material; and

operation apparatus positioned to move said second cutting die relative to said second cutting structure for forming said second increment and for urging said second increment against said second location of said at least a second portion of said semiconductor die mounting site of said first leadframe of said plurality of leadframe.

2. The system of claim 1, wherein said first source includes:

a first adhesively coated material supply for supplying said first length of adhesively coated material.

3. The system of claim 2, wherein said second source includes:
a second adhesively coated material supply for supplying said second length of adhesively coated material.

4. The system of claim 1, wherein said application apparatus includes apparatus for receiving a plurality of leadframes connected together one to another.

5. The system of claim 4, wherein said application apparatus further includes apparatus for receiving and for positioning a plurality of leadframes having a removable edge with drive perforations formed therein.

6. The system of claim 5, further comprising a controller in electrical communication with said operation apparatus for sending and receiving operation signals thereto, and wherein said operation apparatus includes:
a first die moving mechanism positioned relative to said first cutting die for moving said first cutting die toward a leadframe of said plurality of leadframes, said first die moving mechanism being in electrical communication with said controller for receiving said operation signals therefrom to cause said first die moving mechanism to move said first cutting die toward said leadframe of said plurality of leadframes.

7. The system of claim 6, wherein said first die moving mechanism includes:
a solenoid mechanism positioned for moving said first cutting die.

8. The system of claim 1, wherein said application apparatus includes:
a block positioned opposite said first cutting die with said first leadframe of said plurality of leadframes positioned between said block and said first cutting die for inhibiting movement of said first leadframe of said plurality of leadframes upon movement of said first cutting die against said first leadframe of said plurality of leadframes.

9. The system of claim 8, wherein said block is sized for positioning opposite both said first cutting die and said second cutting die having a leadframe of said plurality of leadframes positioned between said block and said first cutting die and having a leadframe of said plurality of leadframes positioned between said block and said second cutting die for inhibiting movement of said plurality of leadframes upon movement of said first cutting die and said second cutting die against said leadframe of said plurality of leadframes.

10. The system of claim 8, wherein said block includes:
heat apparatus for heating said block, said first increment contacting said first leadframe of said plurality of leadframes, and said second increment contacting said second leadframe of said plurality of leadframes.

11. The system of claim 1, wherein said application apparatus includes:
a first guide for said first length of adhesively coated material and a second guide for said second length of adhesively coated material.

12. The system of claim 1, wherein said first cutting structure and said second cutting structure are connected.

13. The system of claim 1, wherein said operation apparatus is configured for urging said first cutting die and said second cutting die to move separately and independently.

14. The system of claim 6, wherein said plurality of leadframes includes a first leadframe, a middle leadframe and a last leadframe, and wherein said indexing apparatus includes apparatus for urging said first leadframe to the first location of said at least a first portion of said semiconductor die mounting site with its first location positioned relative to said semiconductor die mounting site to receive said first increment upon activation of said first source and with its second location positioned to not be contacted by said second cutting die, wherein said controller is in electrical communication with said first source and said second

source and is for electrically sending operation signals for activating said first source to supply said first length of adhesively coated material to said first cutting structure and not activating said second source.

15. The system of claim 14, wherein said indexing apparatus includes apparatus for urging said middle leadframe to have its first location of said at least a first portion of said semiconductor die mounting site positioned relative to said first cutting die for receiving said first increment upon activation of said first source and said first cutting die and thereafter for urging said middle leadframe to have its second location of said semiconductor die mounting site positioned relative to said second cutting die for receiving said second increment upon activation of said second source and said second cutting die, and wherein said controller is for electrically sending operation signals for activating said first source to supply said first length of adhesively coated material to said first cutting structure and for activating said second source to supply said second length of adhesively coated material to said second cutting structure.

16. The system of claim 15, wherein said indexing apparatus further includes apparatus for urging said last leadframe to be positioned with its second location of said semiconductor die mounting site positioned relative to said second cutting die for receiving said second increment upon activation of said second source and said second cutting die, with its first location of said semiconductor die mounting site positioned to not be contacted by said first cutting die, and wherein said controller includes apparatus for electrically sending operation signals to activate said second source to supply said second length of adhesively coated material to said second cutting structure and to not activate said first source.

17. The system of claim 16, wherein said indexing apparatus further includes apparatus for urging said first leadframe, said middle leadframe and said last leadframe for moving continuously in sequence.

18. A system for applying adhesively coated material to a portion of a semiconductor die mounting site of a leadframe of a plurality of leadframes for semiconductor devices comprising:

a first source for supplying a first length of adhesively coated material at a first location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes in a continuous manner;

a second source for supplying a second length of adhesively coated material at a second location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes in a continuous manner;

indexing apparatus for supplying said plurality of leadframes for semiconductor devices in a leadframe-by-leadframe sequence at a first location and a second location of said portion of said semiconductor die mounting site, said indexing apparatus including apparatus for urging said plurality of leadframes in a desired position for application of adhesively coated material;

application apparatus for receiving said plurality of leadframes for semiconductor devices in a leadframe-by-leadframe sequence, for receiving said first length of adhesively coated material at the first location of said portion of said semiconductor die mounting site and for receiving said second length of adhesively coated material at the second location of said portion of said semiconductor die mounting site, said application apparatus having cutting apparatus for cutting a first increment of said first length of adhesively coated material and for applying said first increment to the first location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes and for cutting a second increment of said second length of adhesively coated material and for applying said second increment to the second location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes after the leadframe of said plurality of leadframes has been subsequently indexed to the second location, said application apparatus including apparatus for receiving a plurality of leadframes connected together one to another; and

control apparatus for electrical communication with said indexing apparatus and for supplying operation signals thereto to supply said plurality of leadframes for semiconductor devices in said leadframe-by-leadframe sequence to said application apparatus to position the first location of said portion of said semiconductor die mounting site and the second location of said portion of said semiconductor die mounting site to receive said first increment and said second increment, respectively, for operating said first source to cause said first length of adhesively coated material to be selectively supplied to said application apparatus when the first location of said portion of said semiconductor die mounting site is positioned to receive said first increment; for operating said second source to cause said second length of adhesively coated material to be selectively supplied to said application apparatus when the second location of said portion of said semiconductor die mounting site is positioned to receive said second increment; and for operating said cutting apparatus to selectively cut and apply said first increment to the first location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes and to cut and apply said second increment to the second location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes after said leadframe of said plurality of leadframes has been indexed to the second location.

19. The system of claim 18, wherein said cutting apparatus includes:
a first cutting structure having a first cutting die located at the first location, the first cutting die for movement relative to said first cutting structure for receiving said first length of said adhesively coated material; and
operation apparatus positioned for moving said first cutting die relative to said first cutting structure for forming said first increment and for urging said first increment toward and against the first location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes for semiconductor devices.

20. The system of claim 19, wherein said cutting apparatus further includes:
a second cutting structure having a second cutting die located at the second location, the second cutting die for movement relative to said second cutting structure configured for receiving said second length of said adhesively coated material; and
said operation apparatus includes apparatus for moving said second cutting die relative to said second cutting structure for forming said second increment and for urging said second increment towards and against said second location of said portion of said semiconductor die mounting site of said leadframe of said plurality of leadframes for semiconductor devices.

21. The system of claim 18, wherein said operation apparatus further includes:
a first die moving mechanism positioned relative to said first cutting die for urging said first cutting die to move toward said leadframe of said plurality of leadframes, said first die moving mechanism being connected to said control apparatus for receiving said operation signals therefrom to cause said first die moving mechanism to move said first cutting die toward said leadframe of said plurality of leadframes.

22. The system of claim 21, wherein said application apparatus further includes:
a block positioned opposite said first cutting die with said leadframe of said plurality of leadframes positioned between said block and said first cutting die for inhibiting movement of said leadframe of said plurality of leadframes upon movement of said first cutting die against said leadframe of said plurality of leadframes.

23. The system of claim 22, wherein said block includes apparatus for positioning opposite both said first cutting die and said second cutting die having said leadframe of said plurality of leadframes positioned between said block and said first cutting die and having a leadframe of said plurality of leadframes positioned between said block and said second cutting die for inhibiting movement of said plurality of leadframes upon movement of said first cutting die and said second cutting die against said leadframe of said plurality of leadframes.

24. The system of claim 23, wherein said block further includes:
heat apparatus for heating said block, said first increment, and said second increment upon
urging of same against said leadframe of said plurality of leadframes.

25. The system of claim 18, wherein said application apparatus includes apparatus for
receiving a plurality of leadframes including a first leadframe, a middle leadframe and a last
leadframe, and wherein said indexing apparatus includes apparatus for urging said first leadframe
to a first position with the first location of said portion of said semiconductor die mounting site
positioned relative to said first cutting die for receiving said first increment upon activation of
said first source and having the second location of said portion of said semiconductor die
mounting site positioned to not be contacted by said second cutting die, wherein said control
apparatus is for electrical communication with said first source and said second source and for
electrically sending operation signals for activating said first source to supply said first length of
adhesively coated material to said first cutting structure and for not activating said second source.

26. The system of claim 18, wherein said indexing apparatus includes apparatus
configured for urging said middle leadframe to have its first location of said portion of said
semiconductor die mounting site positioned relative to said first cutting die for receiving said
first increment upon activation of said first source and said first cutting die and thereafter for
urging said middle leadframe to have its second location of said portion of said semiconductor
die mounting site positioned relative to said second cutting die for receiving said second
increment upon activation of said second source and said second cutting die, and wherein said
control apparatus is for electrically sending operation signals for activating said first source for
supplying said first length of adhesively coated material to said first cutting structure and for
activating said second source for supplying said second length to said second cutting structure.

27. The system of claim 26, wherein said indexing apparatus further includes apparatus for urging said last leadframe to be positioned with its second location of said portion of said semiconductor die mounting site positioned relative to said second cutting die for receiving said second increment upon activation of said second source and said second cutting die and with its first location of said portion of said semiconductor die mounting site positioned for not contacting any portion thereof by said first cutting die, and wherein said control apparatus is configured for electrically sending operation signals for activating said second source to supply said second length of adhesively coated material to said second cutting structure and for not activating said first source.